CROSBY & OVERTON, INC.

Environmental Management

1610 W. 17th Street
Long Beach, California 90813
FAX (213) 436-7540
(213) 495-4011 ▪ (213) 432-5445

PREPARED FOR: DOUGLAS AIRCRAFT COMPANY
19503 SOUTH NORMANDIE AVENUE
TORRANCE, CALIFORNIA

EXCAVATION OF HYDROCARBON CONTAMINATED SOIL, SOIL SAMPLING AND ANALYSIS AT C-6, TORRANCE, CALIFORNIA

PREPARED BY: CROSBY & OVERTON ENVIRONMENTAL MANAGEMENT, INC.
1610 W. 17TH STREET
LONG BEACH, CALIFORNIA

OCTOBER 26, 1988

WRITTEN BY:

John Hubbard

JOHN HUBBARD
HYDROGEOLOGIST

REVIEWED BY:

Roger Nielson

ROGER NIELSON
CA REG. GEOLOGIST
1801

TABLE OF CONTENTS

PLATES

APPENDICES

DOUGLAS AIRCRAFT COMPANY

19503 South Normandie Avenue, Torrance, California 90502

January 11, 1989
C6-722-KDA-89-004

Mr. John Kitchens
Underground Tank Unit
City of Los Angeles Department of Fire
200 N. Main Street
Los Angeles, CA 90012

Dear Mr. Kitchens;

On 02/16/88 we sent to you Crosby and Overton's site assessment for our underground tank removal project at the Torrance Facility. On 05/04/88 you sent us a letter requesting further information on the extent of contamination.

During the summer of 1988, Crosby and Overton performed further excavation of soil at the sites of tanks 27T, 28T, 31T, 32T, 33T, and 37T. Enclosed is the report documenting the further excavation, and the results of additional sampling and analysis. In the report, you will find that several of the holes were dug to clean soil, and were backfilled. Others were dug deeper and wider, but a certain level of contamination remains. Crosby and Overton states in the report that they have reached limits imposed by accessibility problems and equipment capability.

The report is hereby submitted for your evaluation. If you have any questions or require further information, please contact me at (213) 533-6755, or Bob Tomko at (714) 229-7052.

Sincerely,

Kent D. Adams

Kent D. Adams
Sr. Plant Engineer
Environmental Compliance, C6-722

CONCURRENCE:

L. A. Szatkowski

L.A. Szatkowski
Branch Manager
Plant Engineering, C6-720

KDA:LAS:lak

Encl: Excavation of Hydrocarbon Contaminated Soil,
Soil Sampling and Analysis, at C-6, Torrance, California

cc: Melissa Henck, C1-705 (211-40)

MCDONNELL DOUGLAS CORPORATION

INTRODUCTION AND BACKGROUND

Upon removing twelve (12) underground storage tanks in September of 1987, hydrocarbon contaminated soil was discovered beneath six of the tanks. In a report dated February 8, 1988 entitled "Site Assessment Investigation for Underground Tanks Removal at Douglas Aircraft Company C6 Facility", Crosby & Overton Environmental Management, Inc. (C&O EMI) recommended the excavation and disposal of contaminated soil in the pits to a level of 1,000 ppm (TPH) diesel and 100 ppm (TPH) gasoline. For specifics about the initial tank pulls and soil sampling, refer to the report cited above.

The following report describes excavation and disposal activities, soil sampling in the excavation pits and offers recommendations as to future work at the site.

GEOLOGY AND HYDROLOGY

Drilling data indicates that the site is immediately underlain by one to two feet of mixed sand, gravel and clay imported fill material. Backfill material in the tank excavations varied from well sorted coarse sand to sandy clays. Below this fill are natural sediments consisting of uniform silty, chalky and clayey fine-grained sands. There was very little local variation and permeabilities were generally poor with no significant avenues for vertical or horizontal migration of fluids.

The C6 site is approximately 50 feet above Mean Sea Level (MSL). Groundwater elevation data collected on November 6, 1987 by Woodward-Clyde Consultants indicates that the water table is over 21 feet below MSL. The depth to groundwater is therefore approximately 70 feet below grade.

EXCAVATION OF HYDROCARBON CONTAMINATED SOIL AT TANK PITS 32T, 37T AND 33T

Tank Pit 32T. Tank 32T was 130-gallon gasoline tank. The excavation proceeded to a depth of 14 feet before the gasoline odor subsided and PID readings dropped-off.

A soil sample was collected at the bottom of the tank pit. The sidewalls were inaccessible to sampling as a result of shoring.

Laboratory analysis for total petroleum hydrocarbons (TPH) (EPA modified 8015) showed non detectable (ND) levels for the soil sample from tank pit 32T.

Tank Pit 37T. This tank pit is associated with a 130-gallon diesel tank. The excavation proceeded to a depth of 18 feet. The bottom and sidewalls of the pit were examined for any physical evidence of hydrocarbon contamination and none was noted.

Laboratory analysis by EPA modified 8015 (TPH) and EPA 7421 (total lead) revealed trace (Tr) levels of TPH (<0.25 ppm). Levels of lead ranged from 5.4 ppm to 9.8 ppm.

Tank Pit 33T. Previously, an 80-gallon gasoline tank was present here. The excavation went to a depth of 18 feet. The pit was inspected for gasoline odor and none was encountered. A soil sample collected at the bottom of the pit showed 28 ppm TPH (Refer to lab analysis dated 7/27/88, Sample 3). The bottom sample was analyzed once more because the gasoline odor emanating from the sample seemed to suggest greater concentrations. The results of the retest showed 110 ppm TPH (Refer to lab data dated 8/10/88, Sample 3).

Samples were collected from the north and south sidewalls of the pit as well. Extensive shoring prohibited sampling the east and west sidewalls.

Laboratory analysis revealed Tr levels of TPH (EPA modified 8015) and total lead values of 7.2 ppm (refer to lab data dated 8/29/88, (Sample 3).

Upon review of the laboratory data, the tank pits were backfilled with clean imported soil. Supervising the backfill was a soil technician from Smith & Emery. The soil technician inspected the bottoms and sidewalls of the tank pits for contaminated soil, and made the determination that the bottoms of the pits were

sufficiently prepared to backfill. As the backfilling of the pits proceeded, the soil was compacted by utilizing a portable compactor until the backfill reached a few feet below grade, at which point compaction was made by "wheel rolling" with heavy equipment. Smith & Emery has certified the fill to be > 90% maximum density (Appendix C).

EXCAVATION OF HYDROCARBON CONTAMINATED SOIL AT TANK PITS 27T, 28T AND 31T

Tank Pits 27T, 28T and 31T are located in areas of very poor accessibility. The excavation of the contaminated soil proceeded very slowly. Logistical problems were encountered daily, including the necessity of moving heavy equipment through buildings that were occupied by active Douglas employees. Often times, excavated soil was transported manually via wheelbarrow to the main stockpile located some 0.25 miles away. Also, overhead constraints often inhibited the excavation process.

Tank Pit 27T. Tank 27T was a 120-gallon gasoline tank. The excavation was deepened to 17 feet and widened to 10' x 10'. The "Case Extendahoe" could go no deeper than 17 feet.

One bottom sample and four sidewall samples were collected and submitted to BCL Laboratories in Huntington Beach to be analyzed for TPH (EPA modified 8015) organic volatiles (EPA 8020) and total lead.

All of the sidewall samples showed ND to Tr levels of TPH and organic volatiles with the exception of the west sidewall (WSW) which contained 11,835 ppm TPH and 620 ppb benzene. A bottom sample showed 5,290 ppm and 780 ppb benzene (Table 1).

Tank Pit 28T. Tank 28T was a 120-gallon gasoline tank. Again the Extendahoe could excavate no deeper than 17 feet. The final excavation was 10′ x 10′x 17′.

Laboratory analysis revealed ND to Tr levels of TPH and BTX for all sidewall samples with the exception of the WSW which contained 3,618 ppm and 640 ppb benzene. The bottom sample showed 566 ppm TPH and ND levels of volatile organics.

Tank Pit 31T. Tank 31T was 120-gallon gasoline tank. The excavation of this tank pit was particularly difficult because space constraints precluded using a backhoe. This excavation was completely hand dug. Very dense and hard clays and silts required the utilization of a clay spade and a compressor as manual digging proved ineffective.

The excavation ended up being 10′ x 10′ x 10′. All sidewall samples showed ND - Tr for TPH and organic volatiles. The bottom sample contained 554 ppm TPH and ND levels of benzene.

CONCLUSIONS

Soil sampling and analysis of Tank Pits 32T, 37T and 33T indicate TPH levels <100 ppm. The pits have been backfilled with clean imported soil compacted to ≥ 90% maximum density.

Although concentrations >100 ppm TPH exist in certain areas of Tank Pits 27T, 28T and 31T, further excavation will require the enlargement of existing doors at the facility in order to move in larger equipment. This would entail a hardship for Douglas Aircraft as the areas that would undergo construction are very close to Douglas employees, thus, production would suffer. Moreover, construction activity of this nature would compromise the health and safety of the Douglas Employees.

Tank Pit 31T contained 554 ppm TPH for the bottom sample but all sidewall samples showed ND. It is difficult to say how deep the contamination has descended, although boreholes drilled adjacent to the tank pits during the first phase of work suggest 20 to 25 feet (Refer to C&O EMI report dated 2/8/88). Extensive shoring, very dense soils and the deepness of the pit had slowed progress to 4"-6" a day the last 3 weeks of excavating.

RECOMMENDATIONS

In light of the difficult logistics involved in the further excavation of Tank Pits 27T, 28T and 31T, leaving the contaminated soil in place may be justified. Borehole data from the first phase of work suggests that the contamination subsides around 20′ - 25′. Groundwater exists some 45′ - 50′ below this, and the soils are very dense and impermeable.

The poorly permeable, fine grained soils underlying the site will most likely preclude the success of in-situ treatment such as vapor extraction or biodegredation. Space constraints and difficult logistics will be an inhibiting factor, just as it was during the excavation work.

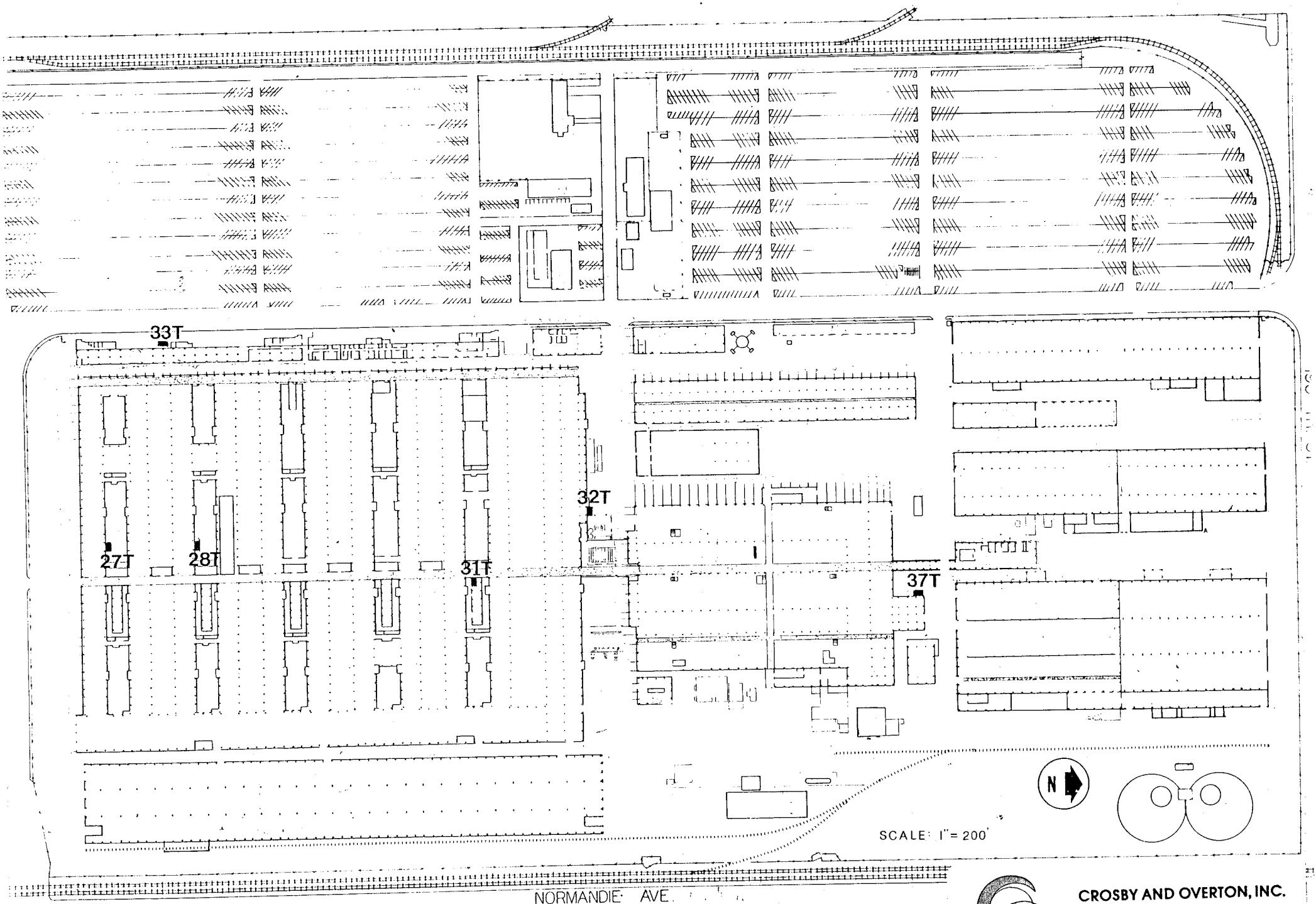

PLATE I. SITE PLAN

MODIFIED FROM DOUGLAS DRAWING # C6-701-PL-1015

CROSBY AND OVERTON, INC.
Environmental Management
1610 W. 17th Street
Long Beach, CA 90813

APPENDIX A

LABORATORY ANALYSIS

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

[redacted]

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

LABORATORY REPORT

Report to: Crosby & Overton EMI
1635 Gaylord
Long Beach, CA
Attention: John Hubbard

Client Job Number:
Laboratory Number: 00348
Report Date: 07/27/88
Received Date: 07/26/88

Purchase Order No.: 54387

Sample Description: Six soil samples in glass jars.

Testing Methods: Hydrocarbon Analysis with Carbon Chain ID/GC-FID; Modified EPA Method 8015.

BCL #	Client Sample #	Modified 8015 Results (mg/Kg)	Date of Analysis	Reporting Limit (mg/Kg)
28-00348-001	1 37T	490	07/26/88	0.1
28-00348-002	2 32T	ND	07/26/88	0.1
28-00348-003	3 33T	28	07/26/88	0.1
28-00348-004	4 27T	4600	07/26/88	0.1
28-00348-005	5 28T	3700	07/26/88	0.1
28-00348-006	6 31T	130	07/26/88	0.1

Carbon Chain numbers are included on the following summary sheets.

ND = None Detected

Rhondi Bobich
Rhondi Bobich
Environmental Chemist

Steve Jones, Ph.D.
Laboratory Manager

3.48F2.R300

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 1
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas C6

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-001

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	7.6	
$C_{11} - C_{12}$	0.1	26	
$C_{13} - C_{14}$	0.1	84	
$C_{15} - C_{16}$	0.1	110	
$C_{17} - C_{18}$	0.1	110	
$C_{19} - C_{20}$	0.1	120	
$C_{21} - C_{22}$	0.1	30	

ND = Not Detected

Gas Chromatography Pattern resembles diesel fuel.

3.48G4.ARS-C013

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 2
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas C6

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-002

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	ND	
$C_{11} - C_{12}$	0.1	ND	
$C_{13} - C_{14}$	0.1	ND	
$C_{15} - C_{16}$	0.1	ND	
$C_{17} - C_{18}$	0.1	ND	
$C_{19} - C_{20}$	0.1	ND	
$C_{21} - C_{22}$	0.1	ND	

ND = Not Detected

3.48G4.ARS-C014

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

[redacted]

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 3
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas CG

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-003

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	7.6	
$C_{11} - C_{12}$	0.1	21	
$C_{13} - C_{14}$	0.1	13	
$C_{15} - C_{16}$	0.1	ND	
$C_{17} - C_{18}$	0.1	ND	
$C_{19} - C_{20}$	0.1	ND	
$C_{21} - C_{22}$	0.1	ND	

ND = Not Detected

Gas Chromatography Pattern resembles gasoline.

3.48G4.ARS-C015

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

[redacted]

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 4
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas C6

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-004

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	1500	
$C_{11} - C_{12}$	0.1	2400	
$C_{13} - C_{14}$	0.1	620	
$C_{15} - C_{16}$	0.1	40	
$C_{17} - C_{18}$	0.1	5.5	
$C_{19} - C_{20}$	0.1	0.14	
$C_{21} - C_{22}$	0.1	0.26	

ND = Not Detected

Gas Chromatography Pattern resembles gasoline.

3.48G4.ARS-C016

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

[redacted]

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 5
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas C6

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-005

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	1300	
$C_{11} - C_{12}$	0.1	1900	
$C_{13} - C_{14}$	0.1	440	
$C_{15} - C_{16}$	0.1	34	
$C_{17} - C_{18}$	0.1	12	
$C_{19} - C_{20}$	0.1	3.3	
$C_{21} - C_{22}$	0.1	0.59	

ND = Not Detected

Gas Chromatography Pattern resembles gasoline.

3.48G4.ARS-C017

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Field No.: 6
Laboratory Job No.: 00348
Date Collected: 07/25/88
Date Received (in lab):
Date Analyzed: 07/26/88
Date Extracted: 07/26/88
Extraction Method: NA
Dilution Factor: 5.000

Client Name: Crosby & Overton EMI
Client Job Number:
Project Name: Douglas C6

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)_____

Laboratory Sample No.: 28-00348-006

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.1	34	
$C_{11} - C_{12}$	0.1	70	
$C_{13} - C_{14}$	0.1	26	
$C_{15} - C_{16}$	0.1	ND	
$C_{17} - C_{18}$	0.1	ND	
$C_{19} - C_{20}$	0.1	ND	
$C_{21} - C_{22}$	0.1	ND	

ND = Not Detected

Gas Chromotagraphy Pattern resembles gasoline.

3.48G4.ARS-C018

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

LABORATORY REPORT

Report to: Crosby & Overton EMI
1635 Gaylord
Long Beach, CA 90813
Attention: John Hubbard

Client Number: Douglas C-6
Laboratory Number: 00348
Report Date: 08/10/88
Received Date: 07/26/88
Purchase Order No.:

Sample Description: One soil sample in a glass jar.

Testing Methods: Hydrocarbon Analysis with Carbon Chain ID/GC-FID; Modified EPA Method 8015.

BCL #	Client Sample #	Modified 8015 Results (mg/Kg)	Date of Analysis	Reporting Limit (mg/Kg)
28-00348-003	3	110*	07/27/88	0.1

Carbon Chain numbers are included on the following summary sheet.

* This analytical information is the result of a reanalysis request by John Hubbard.

Rhondi Bobich
Environmental Chemist

Steve Jones, Ph.D.
Laboratory Manager

3.48F2.R321

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Hydrocarbon Analysis with Carbon Chain ID
EPA Method 8015

Client Name: Crosby & Overton
Client Job Number: 3
Project Name:

Client Field No.: Douglas CG
Laboratory Job No.:
Date Collected: 07/26/88
Date Received (in lab):
Date Analyzed: 07/27/88
Date Extracted: 07/27/88
Extraction Method:

Sample Matrix:

[ ] Water (milligrams per liter)

[X] Soil (milligrams per kilogram)

[ ] Other (specify)

Laboratory Sample No.: 28-00348-003

Compound	Method Detection Limit (MDL) (mg/Kg)	Concentration Detected (mg/Kg)	Notes
$C_8 - C_{10}$	0.10	23	
$C_{11} - C_{12}$	0.10	59	
$C_{13} - C_{14}$	0.10	32	
$C_{15} - C_{16}$	0.10	ND	
$C_{17} - C_{18}$	0.10	ND	
$C_{19} - C_{20}$	0.10	ND	
$C_{21} - C_{22}$	0.10	ND	

3.48G4.ARS-C019

BCL

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

L A B O R A T O R Y R E P O R T

Report to: Crosby & Overton EMI
1635 Gaylord
Long Beach, CA.
90813

Client No: G-2361
Laboratory No: 00411
Report Date: 08-29-88
Recieved Date: 08-25-88

Attention: John Hubbard

Purchase Order No:

Sample Description: Seven soil samples.

Testing Methods: Total Lead/AA; EPA 7421.
Volatile Hydrocarbons/GC-FID;
Modified EPA 8015.

BCL #	Client Sample #	Results (mg/Kg) Mod 8015	Results (mg/Kg) Lead	Reporting Limit(mg/Kg) Mod 8015	Reporting Limit(mg/Kg) Lead
28-00411-001	1A(bottom)	Trace	5.4	0.25	0.05
28-00411-002	1(South Sidewall)	Trace	8.2	0.25	0.05
28-00411-003	1(North Sidewall)	Trace	9.8	0.25	0.05
28-00411-004	1(West Sidewall)	Trace	8.3	0.25	0.05
28-00411-005	1(East Sidewall)	Trace	8.8	0.25	0.05
28-00411-006	3(North Sidewall)	Trace	7.2	0.25	0.05
28-00411-007	3(South Sidewall)	Trace	7.2		

Jesus Malla for RR
Rhondi Bobich
GC Group Leader

Steve Jones, Ph.D.
Lab Manager

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

LABORATORY REPORT

Report to: Crosby & Overton EMI
1635 Gaylord
Long Beach, CA.
90813

Project Name: Douglas AC (C-6)
Client Number: G-2361
Laboratory No: 00460
Report Date: 09-26-88
Received Date: 09-19-88

Attention: John Hubbard

Purchase Order No:

Sample Description: Fifteen soil samples in glass jars.

Testing Methods: Total Lead/AA Graphite Furnace; EPA Method 7421.
Hydrocarbon Analysis with Carbon Chain ID/ GC-FID; Modified EPA Method 8015.
Aromatic Volatile Organics/GC-PID; EPA Method 8020.

BCL #	Client Sample #	Total Lead Results (mg/Kg)	Date of Analysis	Total Lead Reporting Limit (mg/Kg)
28-00460-001	27T-Bottom	17	09-21-88	2.0
28-00460-002	27T-NSW	5.6	09-21-88	2.0
28-00460-003	27T-SSW	5.6	09-21-88	2.0
28-00460-004	27T-ESW	5.5	09-21-88	2.0
28-00460-005	27T-WSW	21	09-21-88	2.0
28-00460-006	28T-Bottom	18	09-21-88	2.0
28-00460-007	28T-NSW	5.0	09-21-88	2.0
28-00460-008	28T-SSW	6.3	09-21-88	2.0
28-00460-009	28T-ESW	4.8	09-21-88	2.0
28-00460-010	28T-WSW	21	09-21-88	2.0
28-00460-011	31T-Bottom	16	09-21-88	2.0
28-00460-012	31T-NSW	5.4	09-21-88	2.0
28-00460-013	31T-SSW	5.1	09-21-88	2.0
28-00460-014	31T-ESW	4.4	09-21-88	2.0
28-00460-015	31T-WSW	5.3	09-21-88	2.0

Results for the modified 8015 and the 8020 analyses are on the following summary sheets.

Rhondi Bobich
GC Group Leader

Steve Jones, Ph.D.
Lab Manager

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 27T BOTTOM
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-001

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	2900
C11-C12	0.1	1800
C13-C14	0.1	460
C15-C16	0.1	130
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 27T NSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-002

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 27T SSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-003

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 27T ESW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-004

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	31
C11-C12	0.1	210
C13-C14	0.1	140
C15-C16	0.1	27
C17-C18	0.1	24
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 27T WSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-005

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	5000
C11-C12	0.1	4500
C13-C14	0.1	1500
C15-C16	0.1	610
C17-C18	0.1	190
C19-C20	0.1	35
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 28T BOTTOM
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-006

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	75
C11-C12	0.1	310
C13-C14	0.1	170
C15-C16	0.1	11
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 28T NSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-007

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 28T SSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-008

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 28T ESW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-009

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 28T WSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-010

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	1800
C11-C12	0.1	1400
C13-C14	0.1	340
C15-C16	0.1	78
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 31T BOTTOM
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-011

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	280
C11-C12	0.1	270
C13-C14	0.1	3.8
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 31T NSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-012

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 31T SSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-013

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 31T ESW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-014

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
MODIFIED METHOD 8015

CLIENT NAME: CROSBY & OVERTON
CLIENT SAMPLE NO: 31T WSW
CLIENT JOB NO: G-2361

SAMPLE MATRIX: SOIL

DATE COLLECTED: 09-21-88
DATE ANALYZED: 09-22-88

DILUTION FACTOR:
EXTRACTION METHOD:

LAB SAMPLE NO: 28-00460-015

CHAIN LENGTH	* MDL (mg\kg)	RESULTS (mg\kg)
C8-C10	0.1	ND
C11-C12	0.1	ND
C13-C14	0.1	ND
C15-C16	0.1	ND
C17-C18	0.1	ND
C19-C20	0.1	ND
C21-C22	0.1	ND

* MDL= METHOD DETECTION LIMIT

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T Bottom
Date Collected: 09-19-88
Date Received (in lab):
Date Analyzed: 09-24-88

Dilution Factor: 1:1000
Extraction Method: 5030

Lab Sample Number: 28-00460-001

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	780		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	21,000		
Toluene	5	12,000		
Xylenes (Dimethyl Benzenes)	15	270,000		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T NSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-26-88

Dilution Factor: 2:1
Extraction Method: 5030

Lab Sample Number: 28-00460-002

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	Trace		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	ND		
Xylenes (Dimethyl Benzenes)	15	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: C & O
Client Job Number: G-2361
Project Name:
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T SSW
Date Collected: 09/19/88
Date Received (in lab): 09/19/88
Date Analyzed: 09/28/88

Dilution Factor:
Extraction Method:

Lab Sample Number: 00460-003

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5.0	ND		
Chlorobenzene	5.0	ND		
1,2-Dichlorobenzene	5.0	ND		
1,3-Dichlorobenzene	5.0	ND		
1,4-Dichlorobenzene	5.0	ND		
Ethyl Benzene	5.0	ND		
Toluene	5.0	ND		
Xylenes (Dimethyl Benzenes)	5.0	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T ESW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor:
Extraction Method: 5030

Lab Sample Number: 28-00460-004

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	Trace		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	Trace		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	5	Trace		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T WSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: 1000
Extraction Method: 5030

Lab Sample Number: 28-00460-005

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	620		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	40,000		
Toluene	5	15,000		
Xylenes (Dimethyl Benzenes)	15	520,000		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

[redacted]

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: C & O
Client Job Number: G-2361
Project Name:
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 28T Bottom
Date Collected: 09/19/88
Date Received (in lab): 09/19/88
Date Analyzed: 09/28/88

Dilution Factor:
Extraction Method:

Lab Sample Number: 00460-006

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5.0	ND		
Chlorobenzene	5.0	ND		
1,2-Dichlorobenzene	5.0	ND		
1,3-Dichlorobenzene	5.0	ND		
1,4-Dichlorobenzene	5.0	ND		
Ethyl Benzene	5.0	ND		
Toluene	5.0	ND		
Xylenes (Dimethyl Benzenes)	5.0	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 27T NSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor:
Extraction Method: 5030

Lab Sample Number: 28-00460-007

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	ND		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	Trace		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	Trace		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 28T SSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-008

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	ND		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	Trace		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 28T ESW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-009

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	ND		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 28T WSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-24-88

Dilution Factor: 5000:1
Extraction Method: 5030

Lab Sample Number: 28-00460-010

Sample Matrix:

___ Water (micrograms per liter)

___ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	640		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	16,000		
Toluene	5	6,200		
Xylenes (Dimethyl Benzenes)	15	95,000		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: C & O
Client Job Number: G-2361
Project Name:
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 31T Bottom
Date Collected: 09/19/88
Date Received (in lab): 09/19/88
Date Analyzed: 09/28/88

Dilution Factor:
Extraction Method:

Lab Sample Number: 00460-011

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5.0	ND		
Chlorobenzene	5.0	ND		
1,2-Dichlorobenzene	5.0	ND		
1,3-Dichlorobenzene	5.0	ND		
1,4-Dichlorobenzene	5.0	ND		
Ethyl Benzene	5.0	240		
Toluene	5.0	31		
Xylenes (Dimethyl Benzenes)	5.0	2100		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby and Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 31T NSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-012

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	Trace		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	Trace		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 31T SSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-013

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	ND		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 31T ESW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-23-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-014

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	Trace		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	Trace		
Xylenes (Dimethyl Benzenes)	15	Trace		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

BCL ASSOCIATES, INC.
Planners • Engineers • Scientists • Chemists

[redacted]

5702 Bolsa Avenue, Huntington Beach, CA 92649 / (714) 892-2565
(213) 437-4148

ANALYTICAL RESULTS SUMMARY
Aromatic Volatile Organics
EPA Method 8020

Client Name: Crosby & Overton
Client Job Number: G-2361
Project Name: Douglas AC (C-6)
Laboratory Supervisor Approval:
Date:

Client (Field) Sample No.: 31T WSW
Date Collected: 09-19-88
Date Received (in lab): 09-19-88
Date Analyzed: 09-24-88

Dilution Factor: NONE
Extraction Method: 5030

Lab Sample Number: 28-00460-015

Sample Matrix:

___ Water (micrograms per liter)

_X_ Soil (micrograms per kilogram)

___ Other (specify)_____

Compound	MDL*	Concentration Detected (ug/Kg) (ppb)	Confirmation (Yes/No)**	Notes
Benzene	5	ND		
Chlorobenzene	5	ND		
1,2-Dichlorobenzene	5	ND		
1,3-Dichlorobenzene	5	ND		
1,4-Dichlorobenzene	5	ND		
Ethyl Benzene	5	ND		
Toluene	5	ND		
Xylenes (Dimethyl Benzenes)	15	ND		

* MDL = Method Detection Limit
** Confirmation was performed according to Method 8010 Column 2 conditions.
@ This compound was detected but its concentration was below the PQL and could not be accurately quantitated.

APPENDIX B

SAMPLING TECHNIQUES AND QUALITY ASSURANCE

SAMPLING TECHNIQUES AND QUALITY ASSURANCE

DRILLING:

Each borehole was drilled with a six inch O.D. hollow-stem auger. Soil samples were collected at 5 foot intervals from the surface to total depth using a standard split-spoon sampler.

SOIL SAMPLING:

To prevent cross contamination between samples, the sampler was washed prior to each sampling using the "three bucket" system. This system involves:

1. Washing split-spoon sampler in a TSP and water solution.
2. Rinsing sampler in tap water.
3. Rinsing sampler in distilled water.

To maintain integrity of each soil sample the following procedures were performed. After extraction brass liners and soil samples were:

1. Sealed in foil.

2. Wrapped with duct tape.

All soil samples are frozen and stored at the lab in anticipation of the need for subsequent analysis.

SAMPLE IDENTIFICATION:

In order to prevent misidentification, all samples were affixed with gummed paper labels that included the following information:

1. Sample number
2. Name of collector
3. Date of collection
4. Place of collection

CHAIN OF CUSTODY PROTOCOL:

In order to establish the documentation necessary to trace sample possession from the time of collection, a chain of custody record was filled out and accompanied every sample.

APPENDIX C

SMITH & EMERY COMPACTION TESTS RESULTS

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard • Los Angeles, California 90021 • (213) 749-3411
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114 • San Francisco, California 94188 • (415) 822-8880
3148 East La Palma Avenue • Anaheim, California 92806 • (714) 630-4910

Date: August 17, 1988

SECo File No.: 80399
SECo Report No.: 88-1635

CROSBY & OVERTON ENVIRON.
1635 Gaylond Street
Long Beach, California 90813

Attention: John Hubbard

RE: MC DONNELL DOUGLAS
90th & Douglas Way
Torrance, CA

SUBJECT: COMPACTION TESTING

REPORT OF TESTS

In compliance with your request, Smith-Emery Company has conducted standard compaction testing for the above referenced project.

Field density tests to determine relative compaction were conducted in accordance with ASTM D1556, sandcone method.

Test locations and results are presented on the attached Table 1. Maximum density/optimum moisture determinations were performed on representative samples in accordance with ASTM D1557, five layer method. Test results are presented on the attached Table 2.

Respectfully submitted,

SMITH-EMERY COMPANY

By_____
JEFF YANG, Ph.D., R.C.E. 43563
Manager - Anaheim Geotechnical

JY:ab
Attachments

2-Addressee

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: August 17, 1988

SECo File No.: 80399
SECo Report No.: 88-1635

Project: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

RESULTS OF MAXIMUM DENSITY/OPTIMUM MOISTURE TESTS

Soil Type	Classification	Maximum Density (PCF)	Optimum Moisture,(%)
1	BROWN SILTY SAND WITH GRAVEL	126.1	11.5

SMITH-EMERY COMPANY - ANAHEIM
TABLE 2

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: August 17, 1988

SECo File No.: 80399
SECo Report No.: 88-1635

Project: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

ELEVATION KEY

SG-Subgrade
FG-Finish Grade
AB-Aggregate Base
FSG-Finish Subgrade
FAB-Finish Agg. Base
BTM-Bottom

METHOD KEY

SC-Sandcone
NG-Nuclear Gauge
DT-Drive Tube

RESULTS OF DENSITY TESTS

Test No.:	Date	Test Type	Elev. Depth (ft.)	Moisture Content (%)	Dry Density (p.c.f.)	Relative Compaction Field (%)	Relative Compaction Specified (%)	Soil Type	Retest No.
1	8-10	SC	-5 FG	10.7	124.1	98	90	1	0
LOCATION: BUILDING 1 HOLE 1									
2	8-10	SC	-3 FG	9.3	119.2	94	90	1	0
LOCATION: BUILDING 1 HOLE 1									
3	8-10	SC	-1 FG	8.1	120.7	95	90	1	0
LOCATION: BUILDING 1 HOLE 1									

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: August 17, 1988

SECo File No.: 80399
SECo Report No.: 88-1635

CROSBY & OVERTON ENVIRON.
1635 Gaylond Street
Long Beach, Calfiornia 90813

Attention: john Hubbard

RE: MC DONNELL DOUGLAS
90th & Douglas Way
Torrance, CA

SUBJECT: COMPACTION TESTING

REPORT OF TESTS

In compliance with your request, Smith-Emery Company has conducted standard compaction testing for the above referenced project.

Field density tests to determine relative compaction were conducted in accordance with ASTM D1556, sandcone method.

Test locations and results are presented on the attached Table 1. Maximum density/optimum moisture determinations were performed on representative samples in accordance with ASTM D1557, five layer method. Test results are presented on the attached Table 2.

Respectfully submitted,

SMITH-EMERY COMPANY

By_____
JEFF YANG, Ph.D., R.C.E. 43563
Manager - Anaheim Geotechnical

JY:ab
Attachments

2-Addressee

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: August 23, 1988

SECo File No.: 80399
SECo Report No.: 88-1657

Crosby & Overton Environmental
1635 Gaylond Street
Long Beach, California 90813
Attention: Mr. John Hubbard

RE: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, California

SUBJECT: MAXIMUM DENSITY/OPTIMUM MOISTURE DETERMINATION

STANDARD: ASTM D1557

SOURCE: Sampled by Smith-Emery Company representative on 8/10/88

REPORT OF TESTS

In compliance with the request of your authorized representative, we have conducted the subject test, as per project requirements for the above referenced project.

The bulk soil sample was returned to our laboratory by our field soil technician.

Test results are as follows:

Sample I.D.	Maximum Density, pcf	Optimum Moisture, %
#1-Brown silty sand with clay and gravel.	126.1	11.5

Respectfully submitted,

SMITH-EMERY COMPANY

By _____
JEFF YANG, Ph.D., R.C.E. 43563
Manager - Anaheim Geotechnical

JY/md
2-Addressee

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: September 7, 1988

SECo File No.: 80399
SECo Report No.: 88-1780

CROSBY & OVERTON ENVIRON.
1635 Gaylord Street
Long Beach, California 90813

Attention: John Hubbard

RE: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

SUBJECT: COMPACTION TESTING

REPORT OF TESTS

In compliance with your request, Smith-Emery Company has conducted standard compaction testing for the above referenced project.

Field density tests to determine relative compaction were conducted in accordance with ASTM D1556, sandcone method.

Test locations and results are presented on the attached Table 1. Maximum density/optimum moisture determinations were performed on representative samples in accordance with ASTM D1557, five layer method. Test results are presented on the attached Table 2.

Respectfully submitted,

SMITH-EMERY COMPANY

By _____
JEFF YANG, Ph.D., R.C.E. 43563
Manager - Anaheim Geotechnical

JY:ab
Attachments

2-Addressee

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: September 7, 1988

SECo File No.: 80399
SECo Report No.: 88-1780

Project: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

ELEVATION KEY

SG-Subgrade
FG-Finish Grade
AB-Aggregate Base
FSG-Finish Subgrade
FAB-Finish Agg. Base
BTM-Bottom

METHOD KEY

SC-Sandcone
NG-Nuclear Gauge
DT-Drive Tube

RESULTS OF DENSITY TESTS

Test No.:	Date	Test Type	Elev. Depth (ft.)	Moisture Content (%)	Dry Density (p.c.f.)	Relative Compaction Field (%)	Relative Compaction Specified (%)	Soil Type	Retest No.
4	8-30	SC	-9 FSG	9.8	125.6	99	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
5	8-30	SC	-7 FSG	10.7	113.8	90	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
6	8-30	SC	-5 FSG	10.4	121.4	96	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
7	8-30	SC	-3 FSG	11.6	126.0	99	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
8	9-1	SC	-1 FSG	11.6	124.4	98	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
9	9-1	SC	SG	8.1	124.4	98	90	1	0
LOCATION: HOLE 2 WEST SIDE BUILDING 3									
10	9-1	SC	-14 FSG	10.6	119.9	95	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									
11	9-1	SC	-12 SG	11.6	115.6	91	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									
12	9-2	SC	-10 SG	8.2	125.3	99	90	1	0
LOCATION: HOLE 3 (37-T) SOUTH OF MACHINE SHOP									
13	9-2	SC	-8 SG	9.8	122.8	97	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									
14	9-2	SC	-6 SG	9.8	119.9	95	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									
15	9-	SC	-4 SG	11.0	124.7	97	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									

SMITH-EMERY COMPANY - ANAHEIM
TABLE 1

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: September 7, 1988

SECo File No.: 80399
SECo Report No.: 88-1780

Project: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

ELEVATION KEY

SG-Subgrade
FG-Finish Grade
AB-Aggregate Base
FSG-Finish Subgrade
FAB-Finish Agg. Base
BTM-Bottom

METHOD KEY

SC-Sandcone
NG-Nuclear Gauge
DT-Drive Tube

RESULTS OF DENSITY TESTS

Test No.:	Date	Test Type	Elev. Depth (ft.)	Moisture Content (%)	Dry Density (p.c.f.)	Relative Compaction Field (%)	Relative Compaction Specified (%)	Soil Type	Retest No.
16	9-2	SC	-2 FSG	12.0	123.4	97	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									
17	9-2	SC	SG	8.9	123.8	98	90	1	0
LOCATION: HOLE 3 SOUTH OF MACHINE SHOP									

SMITH-EMERY COMPANY
An Independent Commercial Testing Laboratory Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg. 114
3148 East La Palma Avenue

• Los Angeles, California 90021 • (213) 749-3411
• San Francisco, California 94188 • (415) 822-8880
• Anaheim, California 92806 • (714) 630-4910

Date: September 7, 1988

SECo File No.: 80399
SECo Report No.: 88-1780

Project: MC DONNELL DOUGLAS
190th & Douglas Way
Torrance, CA

RESULTS OF MAXIMUM DENSITY/OPTIMUM MOISTURE TESTS

Soil Type	Classification	Maximum Density (PCF)	Optimum Moisture,(%)
1	BROWN SILTY SAND WITH CLAY & GRAVEL	126.1	11.5

SMITH-EMERY COMPANY - ANAHEIM
TABLE 2